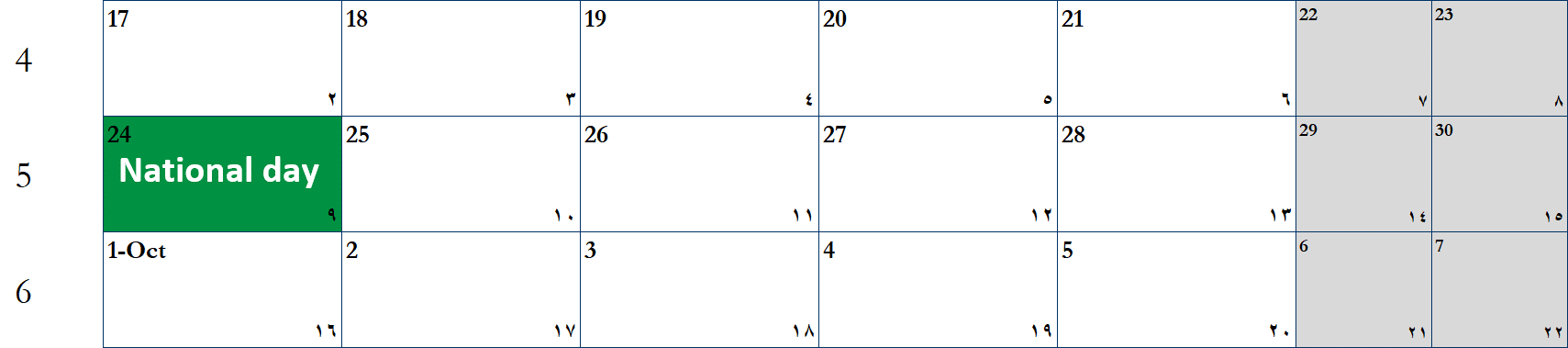
**King Fahd University of Petroleum & Minerals**

Information and Computer Science Department  
**SWE 316: Software Design and Construction (Term 231)**

Homework # 1 Weight 8%



Due Date

HW # 1

# Instructions

1. Answers have to be typed; **handwritten solutions will not be accepted**.
2. Submission:
   1. through BlackBoard
   2. **Softcopy** - report in PDF  format (**WORD format is NOT acceptable**).
   3. **Source code** should be submitted as a single compressed file
3. The report should include a **cover page** showing: course name, assignment number, date of submission, your names and ID’s
4. Include the following table in your cover page

|  |  |  |  |
| --- | --- | --- | --- |
| **Task** | **Grade** | **Your Grade** | **Comments** |
| Task # 1: Class Diagram | 30 |  |  |
| Task # 2: Application | 50 |  |  |
|  |  |  |  |
| Check list and penalties  No Cover page with grade table -10 🞎  File name (report) -5 🞎  Not in PDF format -10 🞎 | | | |
| Total | 80 |  |  |

1. Include the question text and then put your answer
2. The file (report) name should be in the following format: **HW<#> - <YOUR ID> - <YOUR NAME>**
3. Your report **MUST** include your code and it should be formatted properly
   1. Copy the code in Notepad++
   2. Code should be in **“Courier New”** font
   3. To format the code choose Menu 🡪 Language 🡪<your selected language>
   4. Click Plugins 🡪 NppExport 🡪Copy RTF to clipboard
   5. Paste it in Word

Try to use some callouts (like this one) to illustrate the code

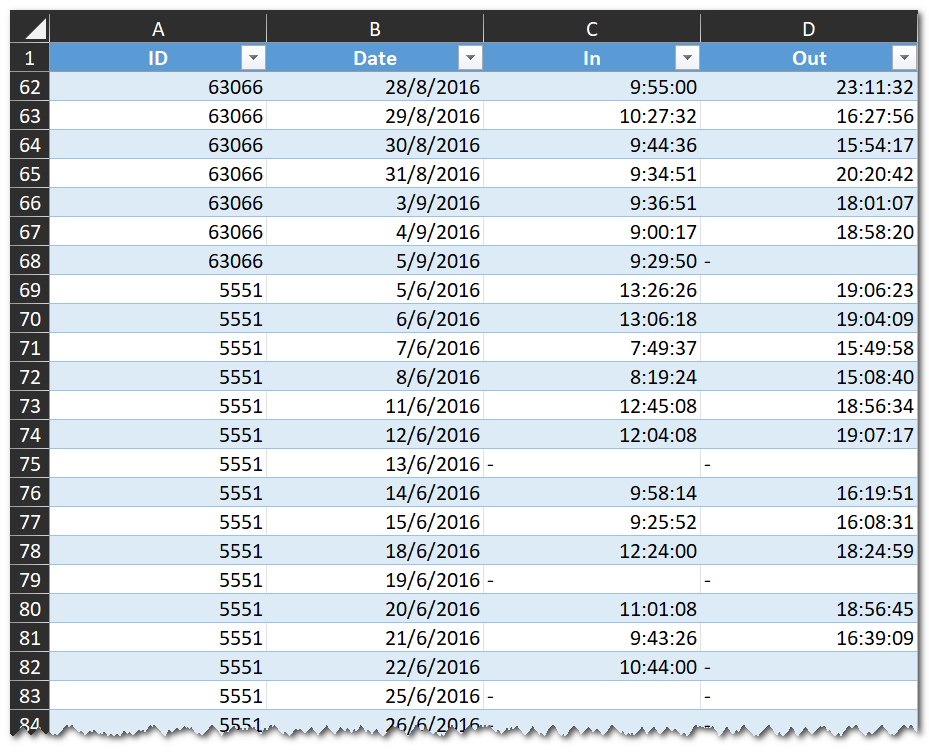
* 1. NOTE: You don’t have to copy ALL your code.   
     Just copy the parts that need to be illustrated.   
     e.g, GUI code is not needed

1. Correct solutions earn full mark. However, ***not following the previous points will reduce your mark.***

# Problem Description Introduction

The HR department at xyzSoft is responsible for all processes related to employees in the company. The company has many gates that can be accesses by cards. Every entry and exit of all employees are logged in a huge log file. The logfile itself is simple in its format consisting of 4 main items:

1. Employee ID
2. Date
3. Time-In (the first time the employee entered the company)
4. Time-Out (the last time the employee exited from one of the gates)



The problem is that this log file is huge (around 50,000 lines for 700+ employees in a 3-months period). The data are stored inside an Excel File the client would like to keep it there so that they can add extra data later.

## What is required?

You are required write a program that visualizes the attendance data by allowing HR and department managers to view their employees. Currently what we would like to do is to have the list of employees in a list. Once the user clicks on one of the employees, it should show a visualization of their attendance in the entire period (3 months)

## Programming Language?

Since the user would like to store the data in an Excel file, he requested to have the program as an addon to Excel. You will be provided a starting VSTO[[1]](#footnote-1) project. You have to develop this project in **Visual Studio using either C# or VB.NET**.

# Task 1: Class Diagram

The problem is not that difficult. You might end up with few class. However, remember that you are a “Designer” not only a programmer! You have to approach this problem having in mind that the requirements might get bigger (remember, you have 2 extra homeworks). Develop a class diagram that reflects this structure and make sure to follow the main principles we discussed in the class including:

* Abstraction and Encapsulation
* Single Responsibility Principle
* Open-Closed Principle

You have to include all fields and methods in every class with proper access modifiers (private, public, etc.). If the relation between two classes is an association, specify the multiplicity, label and direction of the relationship. Make sure that your class diagram represents all needed components in this system.

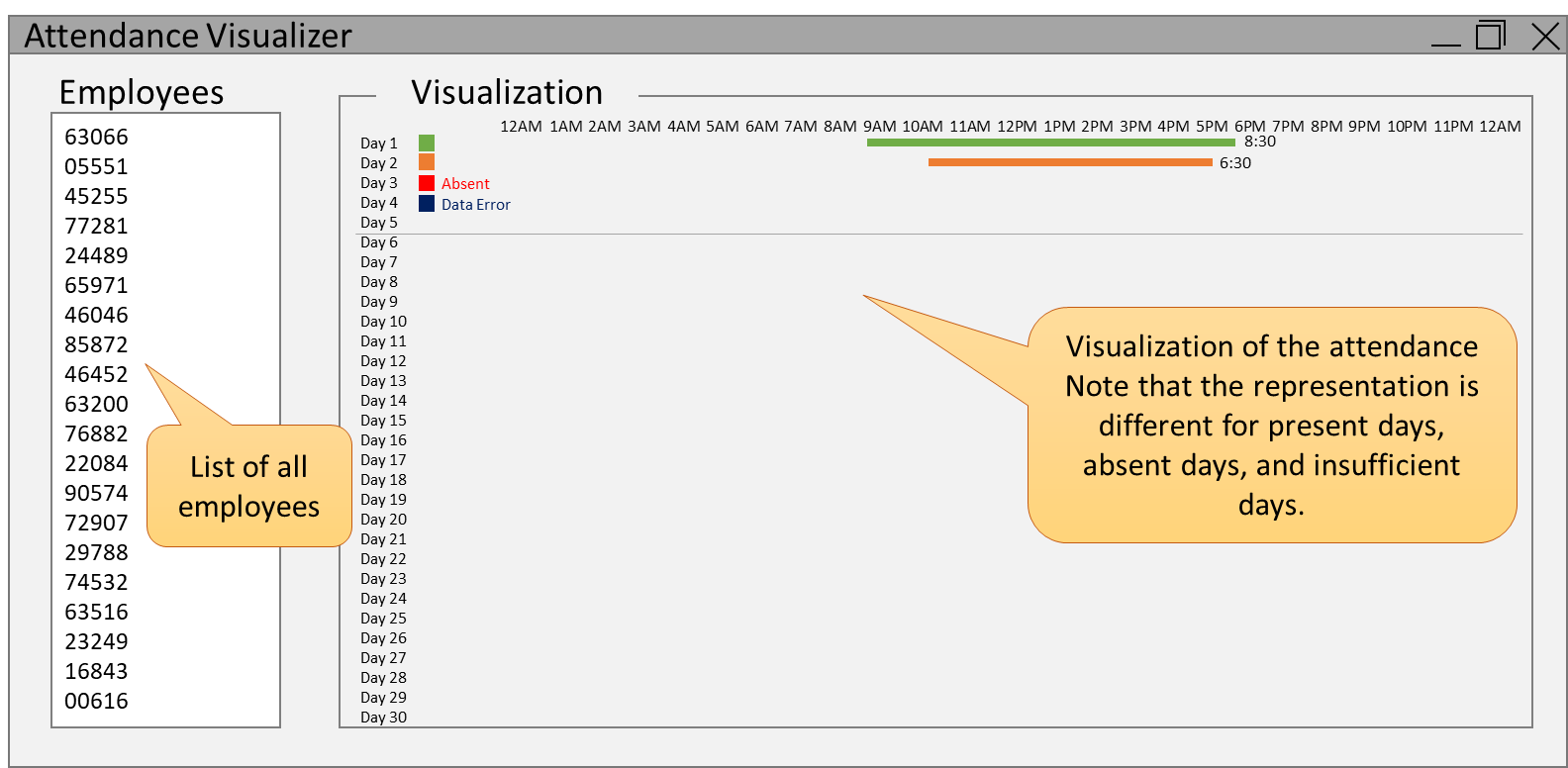
# Task 2: Develop the application

Develop your program to fulfill the following requirements:

1. When executed, it should parse the Excel file reading all of its contents.
2. You should construct Employee objects and Attendance objects separately.
3. The list of Employees should be presented in the program in a listbox
   1. Currently you only have employees ID’s. This might change later.
4. When you click one of the employees in the list, you should visualize his/her attendance as shown in the following picture (This is only a sketch and you are welcome to enhance it according to your understanding of this domain)

### Visualization Specification (See the picture below)

1. Draw all days in a vertical mode
2. Draw hours horizontally
3. Drawing attendance:
   1. The attendance bar should depend on the Time-In and Time-Out (bar length should depend on the duration of employee attendance).
   2. After the bar, your should draw the duration of the visit in number (e.g. 8:30)
   3. The color of the is based on the status of that day:
      1. Present (8 hours or more): Green
      2. Insufficient (less than 8 hours): Orange
      3. Absent: Red (no bar)
      4. Data Error: Blue (in case the Time-In or Time-Out is not available)
4. Draw a gray line indicating the week has started or ended



NOTE: Your program should reflect your class diagram

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<< END >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

1. Walkthrough: Create your first VSTO Add-in for Excel (<https://learn.microsoft.com/en-us/visualstudio/vsto/walkthrough-creating-your-first-vsto-add-in-for-excel?view=vs-2022&tabs=csharp>) [↑](#footnote-ref-1)